

# NAHLN Update



June 2011



NAHLN- A State and Federal Partnership to Safeguard Animal Health



# Presentation Overview



History and Background

Current Capabilities

Application of Capabilities

2011 Activities to Enhance  
Capabilities

Conclusions



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# The National Animal Health Laboratory Network

- Formed in 2002
- Is a group of State funded veterinary diagnostic labs that deal with diseases of animals including endemic, exotic, zoonotic, and emerging diseases
- Is a **partnership** between:
  - USDA (APHIS and NIFA)
  - AAVLD
  - NAHLN Laboratories



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# The Purposes of NAHLN

- Early detection
  - Targeted surveillance based on population density & risk
- Rapid response
  - Surge capacity to test outbreak samples
- Appropriate recovery
  - Large numbers of samples tested to show freedom



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# Founding Principles and Features of NAHLN

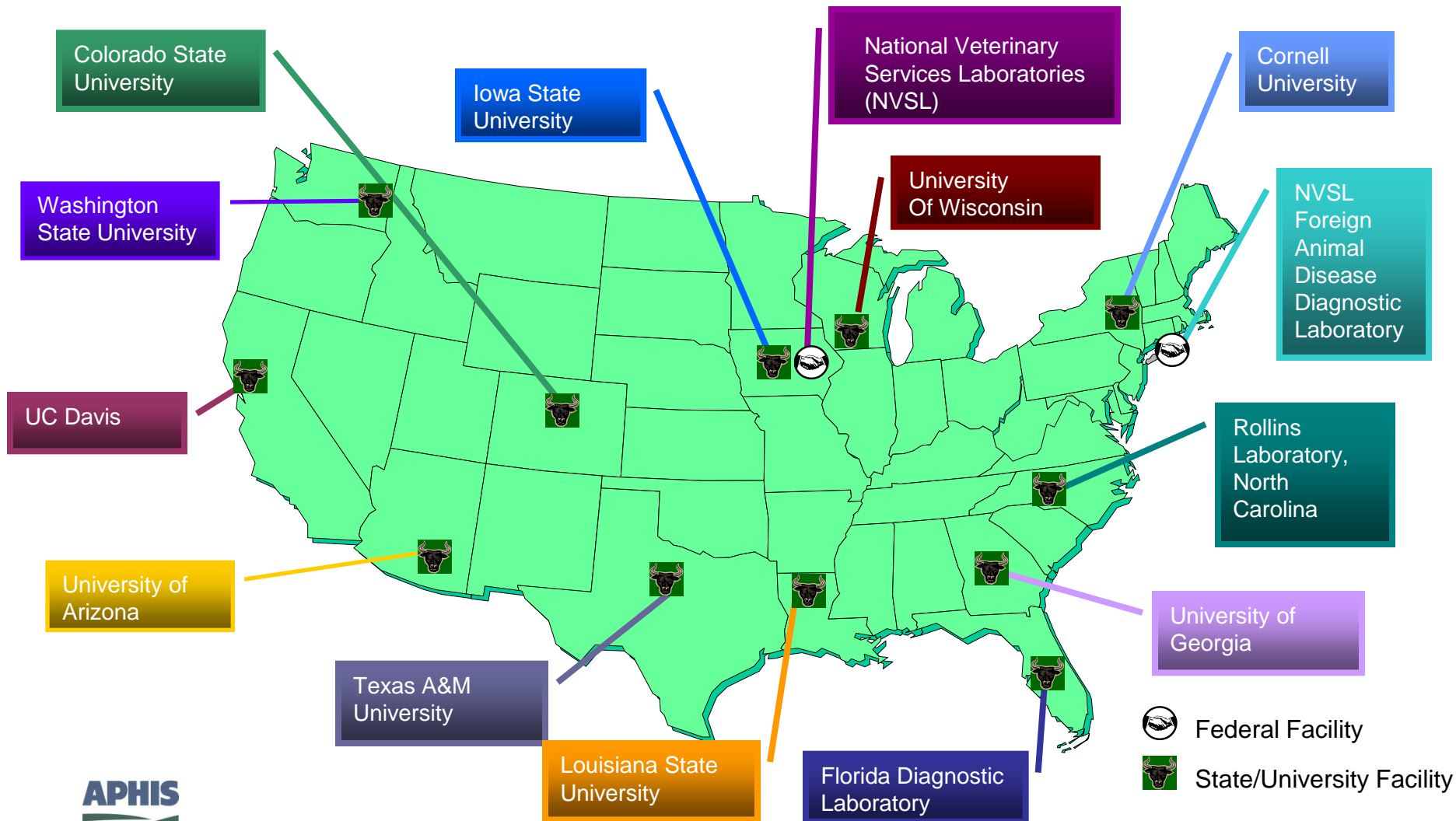
- Standardized, rapid diagnostic techniques
- Secure electronic communications and reporting system
- Trained personnel, modern equipment
- Quality standards, proficiency testing
- Adequate facility biosafety/biosecurity levels
- Scenario testing
- Laboratory review and approval process



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# The original 12 NAHLN laboratories

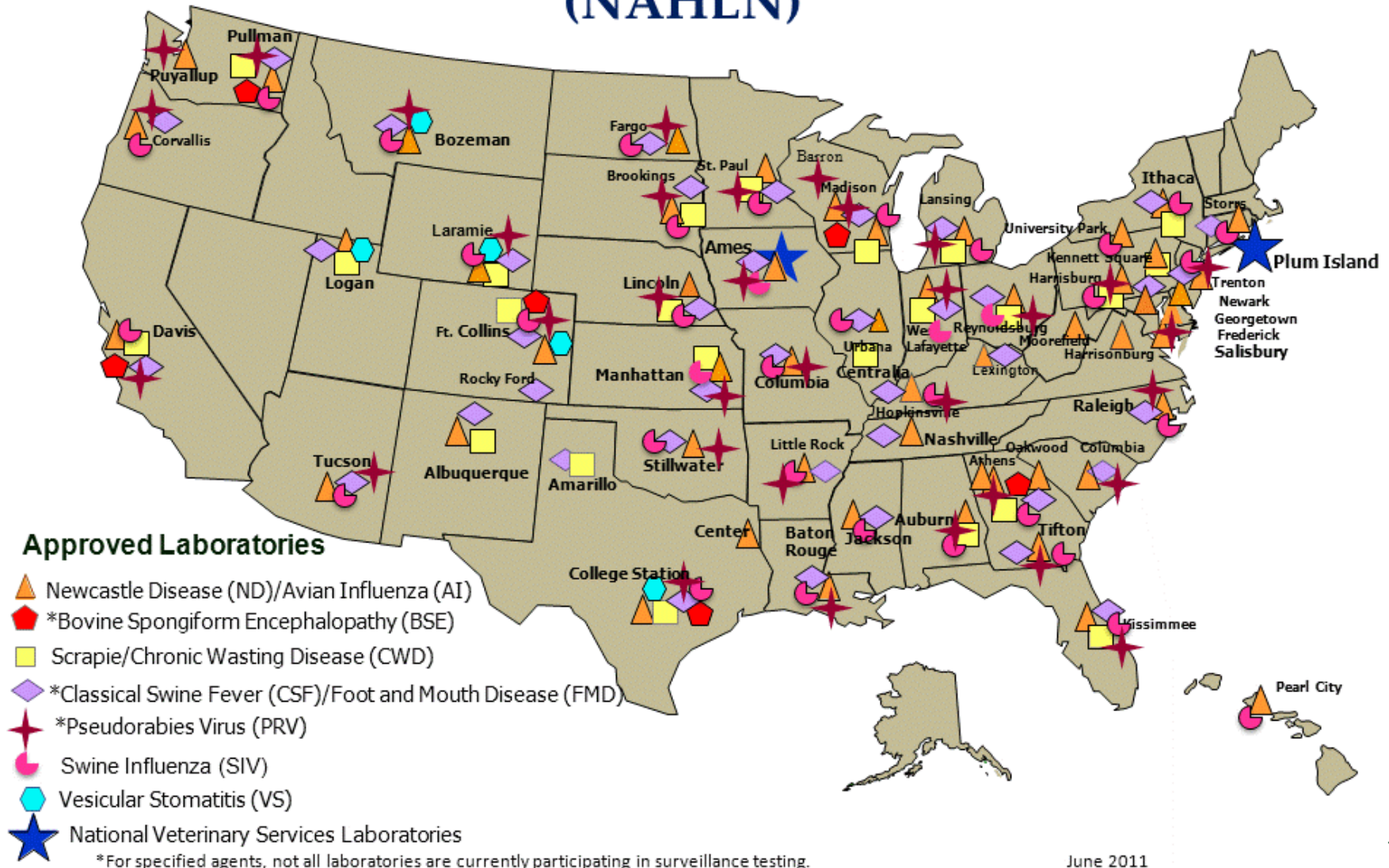


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# National Animal Health Laboratory Network (NAHLN)



# Designation of Laboratories in the NAHLN

- **Core Member laboratory** – labs that are receiving significant infrastructure support and are conducting fee for service testing from USDA. This group currently includes the original 12 laboratories.
- **Member laboratory** – labs that are receiving limited annual support from USDA for specific purposes and also perform fee for service testing.
- **Contract Member laboratory** – labs that are performing fee for service testing for control of specific animal diseases **ONLY**.
- **Adjunct Member laboratory** – labs that wish to be members of the NAHLN but whose primary mission is not domestic animal disease diagnostic work within the United States.

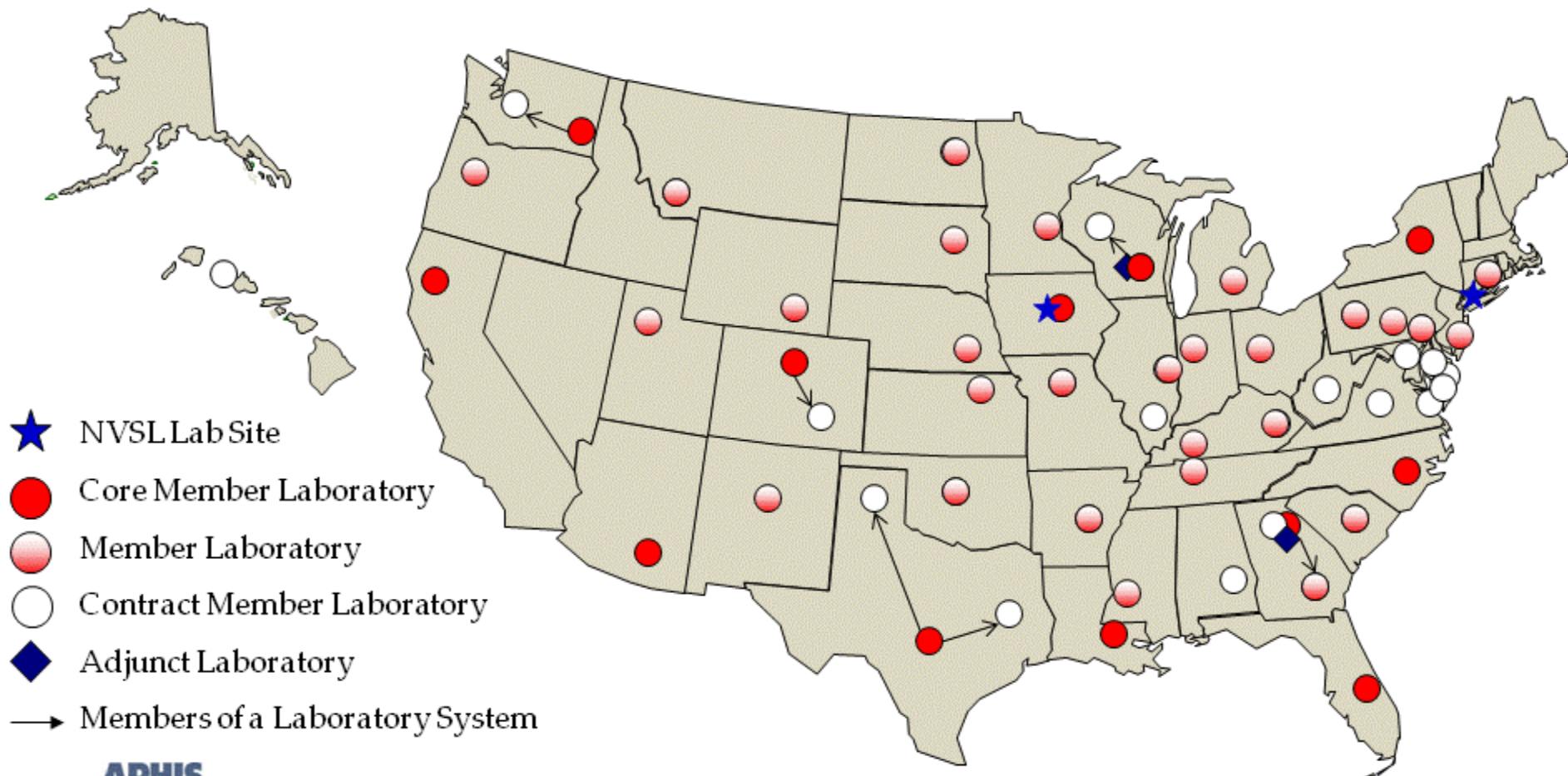


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# NAHLN Laboratory Designations



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**Adjunct Member  
Laboratory**

1. QA System implemented
2. Quality Manager
3. Trained staff in molecular diagnostic testing

**Contract Member  
Laboratory**

1. QA System implemented
2. Quality Manager
3. Trained staff in molecular diagnostic testing
4. Participation in various surveillance activities
5. Functional Laboratory Information Management System (LIMS)
6. Test data reported within time frames indicated in SOPs

**Member  
Laboratory**

1. Fully or provisionally accredited by AAVLD or by an accrediting body according to the OIE/ISO 17025 standard to cover the scope of NAHLN testing
2. Active participation in electronic messaging of surveillance test results
3. Trained staff in molecular diagnostic testing
4. Participation in various surveillance activities
5. Test data reported within time frames indicated in SOPs

**Core Member  
Laboratory**

1. Fully accredited by AAVLD or by an accrediting body to the OIE/ISO 17025 standard to cover the scope of NAHLN testing
2. Provides and maintains BSL3 laboratory space with sample handling, processing, and testing capacity
3. Shall agree to send staff out to other labs or the field for emergency operations
4. Shall provide train the trainer expertise, as requested
5. Competence, capability, and capacity for high-throughput testing
6. Active participation in electronic messaging of surveillance test results
7. Test data reported within time frames indicated in SOPs
8. Agrees to assist other laboratories to develop and implement IT capabilities
9. Shall accept samples from other states impacted by a disease outbreak
10. Provides funding associated with maintaining equipment and laboratory space used for NAHLN purposes

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# Current Capabilities



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# Standardized Rapid Diagnostic Techniques

- NAHLN Methods Technical Working Group
  - Purpose: to provide input on various aspects of methods validation and approval
    - Review of available methods and associated gaps
    - Identification of potential new technologies
    - Validation and methods comparison criteria and approval processes
    - Dossier review and assay approval process
    - Continual performance assessment of assays
- Current standardized methods:
  - AI, BSE, CSF, CWD, END, FMD, PRV, SIV, Scrapie, VSV



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# Secure Communications and Reporting System

## *NAHLN IT System*

- Established a system with data and messaging standards to ensure accurate and consistent diagnostic information is quickly and securely transmitted.
  - NAHLN IT Committee
- Laboratories messaging into NAHLN IT system
  - 13 CSF
  - 12 AI



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# Trained Personnel and Modern Equipment

## *Train the Trainer Program*

- Established 2005 in response to need to increase number of people trained and proficiency tested to address animal health emergencies
- Incremental growth of approved laboratories and analysts

	Approved Laboratories		Approved Analysts	
Disease/Agent	FY2004	FY2010	FY2004	FY2010
AI	15	54	28	218
CSF	12	39	24	169
END	15	52	28	207
FMD	12	40	24	174



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# Quality Standards and Proficiency Testing

## *Proficiency Testing Program*

- NVSL – National reference lab
  - Provides proficiency test panels and reference materials
- Requirement - must successfully complete proficiency test process to participate in NAHLN surveillance activities
  - Competency assessment
  - Frequency
    - 6 months to 1 year
- Diseases/agents
  - AI, ASF, BSE, CSF, CWD, END, FMD, PRV, rinderpest, scrapie, SIV, VSV



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# Quality Standards and Proficiency Testing

## *Quality Management System Training*

- AAVLD, ISO 17025/ OIE standard
  - Document control, records, internal auditing, management review, corrective actions, root cause analysis
- Interactive learning environment
  - Wet lab – application of skills
- 2010 training - 87 participants representing 52 labs
  - 40 NAHLN laboratories
  - 8 prospective laboratories
  - 3 Federal and one international lab
- Summary report and recommendations



# Scenario Testing

- **2008 - Highly Pathogenic Avian Influenza**
  - 38 Regional presentations in 2008
  - 700 Participants
    - Animal Health
    - Public Health
- **2010 – Foot and Mouth Disease**
  - Inspired by the 2007 HPAI Exercise Series
  - 5 part series
    - VS Policy-level workshop
    - Kansas State table top exercise
    - 15 follow-up exercises
    - NVSL table top exercises
    - Follow-up policy exercise



# Laboratory review and approval process

- Developed in conjunction with AAVLD Accreditation Committee
  - Consistent with ISO 17025/ OIE standards
  - Site visits
  - Audit report and response
  - Piloted 2008, implemented 2009
- Evaluation of processes and Annual Report
  - Input from audited labs and stakeholders
  - Establish annual goals and recommendations
- Development of associated audit documents
  - NAHLN Audit SOP
  - Guidance documents



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# Application of Capabilities



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# Surveillance Programs

- Surveillance plan, procedure manual and communication guidance
- Diseases/agents
  - AI/ND                      – PRV
  - BSE                        – CWD & Scrapie
  - CSF                        – SIV
  - VSV
- Benefits
  - Early detection
  - Increased technical proficiency
  - Improved communication
  - Improved preparedness



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# Classical Swine Fever

- 1<sup>st</sup> Plan developed by National Surveillance Unit with stakeholder input
  - Target clinical signs, feral swine, slaughter condemned
  - All high risk states involved
- Implemented in January 2006
- Personnel from 40 laboratories trained and PT'd
- >6000 samples tested / year
- Data submission
  - Web based and electronic messaging



# Swine Influenza Virus

- Implemented in May 2009
- Personnel from 36 laboratories trained and PT'd
  - Personnel must have successfully completed AI PT
- Approved screening assays
  - Matrix PCR
  - N1 PCR
  - Virus Isolation
  - Sequencing
- >1200 samples tested / year
- Target diagnostic samples from swine with clinical signs



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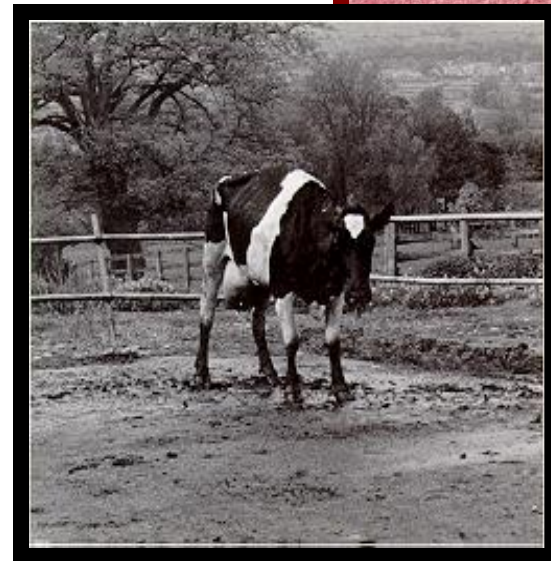
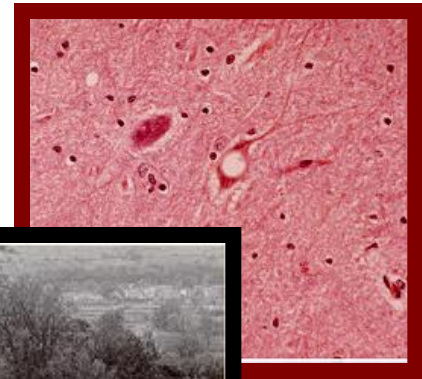
# Avian Influenza and Newcastle Disease Virus

- Personnel from 53 laboratories trained and PT'd
- Conducting surveillance using rRT-PCR
  - Veterinary Services
  - Wildlife Services
- >40,000 samples tested / year for AI surveillance in wildbirds



# Bovine Spongiform Encephalopathy

- Personnel from 6 laboratories trained and PT'd
- Enhanced surveillance
  - >959,800 samples tested since June 2004
- Maintenance surveillance
  - September 2006
  - > 40,000 samples/year





# Chronic Wasting Disease and Scrapie

- Personnel from 23 laboratories trained and PT'd
- >19,000 CWD samples tested/year
- >45,000 Scrapie samples tested/year



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# Pseudorabies Virus

- Personnel from 34 laboratories trained and PT'd
- Pilot surveillance began in 2009
  - 10 NAHLN Laboratories participated
- 2010 PRV Surveillance
  - 16 NAHLN Laboratories participating
- >18,000 samples tested / year



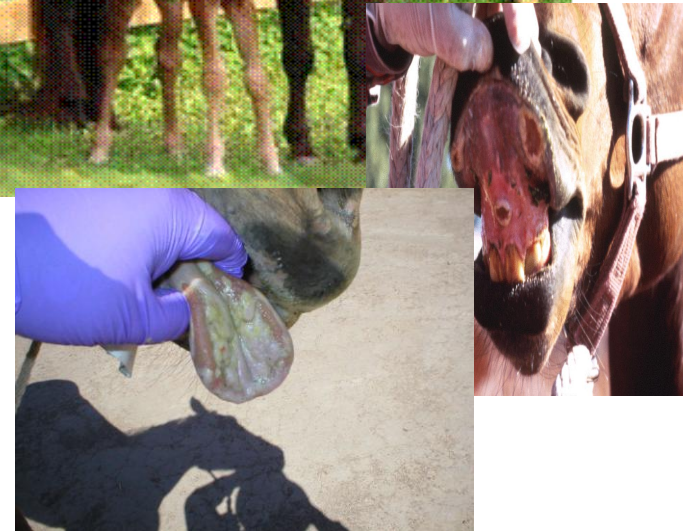
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# Vesicular Stomatitis Virus

- Personnel from 5 laboratories trained and PT'd
- Activated following confirmation of an outbreak
- Equids only
- Serology – CF test



# Foot and Mouth Disease

- Personnel from 40 laboratories trained and PT'd
- Assay validated
  - Dossier review in 2007
  - Negative cohort 2010-2011
- Use of assay in an outbreak situation



# Testing Samples from Foreign Animal Disease Investigations

- Revisions to VS Memo 580.4
  - Procedures for a suspected FAD or EDI
  - Samples can be split and sent to NVSL and approved NAHLN labs
  - Confirmatory testing at NVSL
- Decrease time for screening test results
- Tools for implementation
  - 580.4 Flow Charts and Ready Reference Guide



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# 2011 Activities to Enhance Capabilities



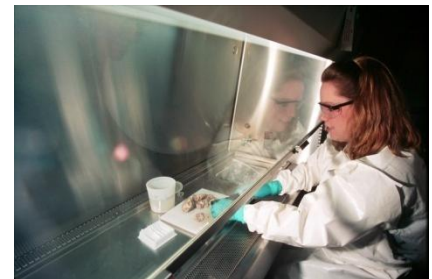
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# Standardized, Rapid Diagnostic Techniques

## *Diagnostic Development - FADDL and NAHLN*

- NAHLN Methods Technical Working Group processes
- Deployment of FMD Serology to NAHLN labs
- Optimization of RNA extraction for early detection of FMD virus in milk from experimentally infected cows
- Enhancements to Molecular Diagnostics for FMD and CSF
- Validation of real time PCRs for Bovine Contagious Pleuropneumonia and Lumpy Skin Disease
  - Continuation of Negative Cohort studies in NAHLN labs



# Secure Communication and Reporting System

## *NAHLN IT Priority Activities*

- Training for Member labs to begin messaging
- Development of order messaging
- Messaging for and/or integration of existing databases:
  - SIV
  - Scrapie/CWD
  - PRV
  - FMD
- Messaging for additional diagnostic assays technologies
  - ELISA
  - IHC
  - VI and sequencing



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# Secure Communication and Reporting System

## *Laboratory Capacity Estimation Program*

- Collaboration between NAHLN/FAZD/AAVLD
- Software tool for evaluating/monitoring NAHLN capacity
  - Daily testing and surge
- Project Objectives:
  - Improve knowledge in individual and overall NAHLN diagnostic testing
  - Prioritization of resources
  - Serve as critical tool for managing a large number of diagnostic tests simultaneously



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# Secure Communications and Reporting System

## *NAHLN Portal*

- Development in cooperation with KSU and UMN
- Modules
  - Secure mechanism to electronically comment on and release SOPs.
  - Laboratory directory including information on physical space, personnel and equipment.
  - Mechanism to monitor assay performance
  - Mechanism to submit and receive PT results
  - Mechanism to train others in the validation process.
  - Work Group and collaboration space to post documents and schedule meetings and calls.
  - Mechanism to schedule meetings and training.
- User acceptance testing by NAHLN



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# Quality Standards and Proficiency Testing

## *NAHLN Outreach and Training*

- Expansion of quality management training
  - Distance and on-line delivery
  - Involvement of other networks
  - Additional training sessions
  - Potential international delivery and participants



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# Scenario Testing

## *NAHLN Program Support for Laboratories*

- Finalize NAHLN operational plan
- Disease outbreak guidelines
  - Use of BSL 2 vs. BSL 3 space
  - Compliance with select agent rule
  - Use of proficiency tested personnel
  - Timelines for reagents and support by other labs
  - Process for financial reimbursement
- NAHLN laboratory triage template



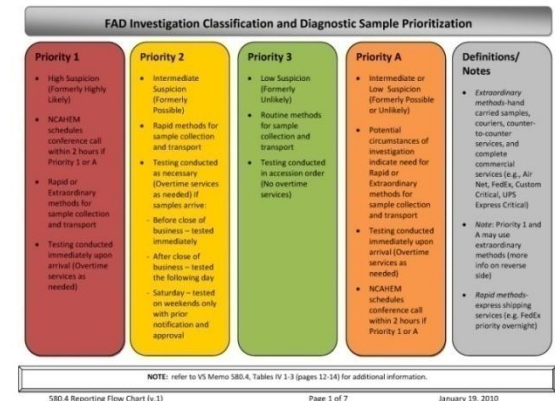
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# Scenario Testing

## VS Memo 580.4 Training

- Work with VS NCAHEM and PDS to improve understanding, use and implementation of VS Memo 580.4
  - APHIS and State field personnel
  - Lab personnel



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# Conclusions



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# Successes of the NAHLN

- Strategically combines the infrastructure and expertise in the state veterinary diagnostic laboratories and the National Veterinary Services Laboratories.
- Established the animal health laboratory backbone of the United States emergency response and recovery program.
- Implemented national, standardized surveillance for high priority diseases.



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# Conclusions

- Increased levels of coordination and collaboration have increased capabilities
- Tremendous progress in the ability to respond
- Much remains to be accomplished
- Partnerships are key to the success of NAHLN!



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# NAHLN Information

- Brochure and Information Cards
- Posters
- Website: [http://www.aphis.usda.gov/animal\\_health/nahln](http://www.aphis.usda.gov/animal_health/nahln)
- Contact information:  
E-mail [nahln@aphis.usda.gov](mailto:nahln@aphis.usda.gov) or phone 515-337-7731



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# Questions?

